

ABSTRACT

A precision controlled fast valve includes a diaphragm, a piezo actuator, and a plunger. The plunger is adapted to engage the diaphragm to create a seal which closes the valve. The piezo actuator is attached to the plunger and adapted to receive control signals which define the distance and speed of travel of the plunger. A control signal is received by the piezo actuator which causes the plunger to rapidly travel to a first position which is proximate to the diaphragm but does not create a seal. A second control signal is received by the piezo actuator which causes the plunger to pinch the diaphragm and creates a seal (due to the blocked force generated by the piezo). Creating the seal without excessive forces reduces the wear on the seal, allowing longer intervals between maintenance.

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